

WHAT IS CLAIMED IS:

1. A retardation optical element having a function of reflecting ultraviolet light, comprising

a retardation layer that has a cholesteric liquid crystalline molecular structure and acts as a negative C plate,

wherein the retardation layer is made so that at least part of its selective reflection wave range is included in an ultraviolet region of 100 to 400 nm and that a maximum reflectance for light in the ultraviolet region is 30% or more.

2. The retardation optical element according to claim 1, wherein the structure of the retardation layer is that of a chiral nematic liquid crystal that has been three-dimensionally cross-linked and solidified.

3. The retardation optical element according to claim 1, wherein the structure of the retardation layer is that of a polymeric liquid crystal that has been solidified into a glassy state.

4. The retardation optical element according to claim 1, further comprising an additional retardation layer laminated to said retardation layer, the additional retardation layer having a selective reflection wave range different in the ultraviolet region from that of said retardation layer.

5. A retardation optical element having a function of reflecting ultraviolet light, comprising:

a first retardation layer that has a cholesteric liquid crystalline molecular structure and acts as a negative C plate; and

a second retardation layer laminated to the first retardation layer, the second retardation layer having a cholesteric liquid crystalline molecular structure and acts as a negative C plate,

wherein the first and second retardation layers are made so that a direction of twisting of liquid

crystalline molecules in the first retardation layer is opposite to that of twisting of liquid crystalline molecules in the second retardation layer, that at least part of the selective reflection wave range of the first retardation layer and at least part of the selective reflection wave range of the second retardation layer are both included in an ultraviolet region of 100 to 400 nm, and that a maximum reflectance for light in the ultraviolet region is 60% or more as a whole.

6. The retardation optical element according to claim 5, wherein the structure of the first retardation layer and that of the second retardation layer are those of chiral nematic liquid crystals that have been three-dimensionally cross-linked and solidified.

7. The retardation optical element according to claim 6, wherein the first and second retardation layers contain substantially the same nematic liquid crystal component, and the direction of twisting of liquid crystalline molecules in the first retardation layer is made opposite to that of twisting of liquid crystalline molecules in the second retardation layer by varying a type of a chiral agent component that is added to the nematic liquid crystal component.

8. The retardation optical element according to claim 5, wherein the structure of the first retardation layer and that of the second retardation layer are those of polymeric liquid crystals that have been solidified into a glassy state.

9. The retardation optical element according to claim 5, further comprising an additional retardation layer laminated to the first or second retardation layer, the additional retardation layer having a selective reflection wave range different in the ultraviolet region from that of the first or second retardation layer.

10. A liquid crystal display comprising:

a liquid crystal cell; and

a retardation optical element having a function of reflecting ultraviolet light, as set forth in claim 1, the retardation optical element being placed on at least one side, relative to a direction of thickness, of the liquid crystal cell,

wherein the retardation optical element having the function of reflecting ultraviolet light selectively reflects light in a predetermined state of polarization, in an ultraviolet region that constitutes a part of its selective reflection wave range, thereby decreasing an amount of ultraviolet light that enters the liquid crystal cell.

11. A liquid crystal display comprising:

a liquid crystal cell; and

a retardation optical element having a function of reflecting ultraviolet light, as set forth in claim 5, the retardation optical element being placed on at least one side, relative to a direction of thickness, of the liquid crystal cell,

wherein the retardation optical element having the function of reflecting ultraviolet light selectively reflects light in a predetermined state of polarization, in an ultraviolet region that constitutes a part of its selective reflection wave range, thereby decreasing an amount of ultraviolet light that enters the liquid crystal cell.